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herbicide in the title or abstract AND 1945:1974 as the publication date AND ICI as the applicant

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966,852



PATENT SPECIFICATION

NO DRAWINGS

966.852

Inventor: ALBERT FREDERICK JAMES WHEELER

Date of filing Complete Specification: Dec. 7, 1960.

Application Date: Dec. 11, 1959.

No. 42172/59.

Complete Specification Published: Aug. 19, 1964.

© Crown Copyright 1964.

Index at acceptance:—A5 E(1C4A2, 1C4A3, 1C4A4, 1C4B2, 1C4B3, 1C4B4, 1C17).

International Classification:—A 01 n

COMPLETE SPECIFICATION

Herbicides

of the fact that a number of

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ERRATUM

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SPECIFICATION No. 966,852

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Page 2, line 88, for "monuron" read "monouron"

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THE PATENT OFFICE
12th September 1967

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they will also kill established vegetation.

Residual herbicides have been widely used for killing grasses and broad-leaved weeds, but most in common use suffer from the disadvantage that a considerable time elapses before they show their full effect. During this time the weeds are in general apparently little affected and continue to be objectionable. It has now been found according to this invention that this disadvantage can largely be overcome by using a residual herbicide in admixture with a 4:4¹ dipyridylum quaternary salt. A number of 4:4¹ dipyridylum quaternary salts have previously been described as having herbicidal activity, but hitherto their value as herbicides has been thought to lie principally in the speed with which they damage the top growth of unwanted vegetation. It has now been found that mixtures of this invention not only provide a rapid kill of weeds, but that in some instances the herbicidal effect obtained using these mixtures is greater than that which would have been expected from an additive herbicidal effect of the constituent herbicides. An additive effect is itself most desirable and cannot be

is an anion. The alkyl radicals R and R₁ are preferably ones having 1—4 carbon atoms.

The dipyridylum salt can optionally be one having one or more substituents in either of the pyridine rings or in one or both of the alkyl radicals. Where one or both of the alkyl radicals has a substituent it can be, for example, a halogen atom, for instance chlorine, or a hydroxyl, carboxyl, alkoxy, carboalkoxy, carbamyl, N - substituted carbamyl or di- or tri-substituted amino groups. The anion can be any one of a large number of anions, for example chloride, bromide, iodide or methosulphate. Examples of 4:4¹ dipyridylum salts which can be used are the compounds disclosed in United Kingdom Specifications Nos. 813,531 and 813,532.

Two 4:4¹ - dipyridylum salts which have been found to be of particular value in compositions according to the present invention are 4:4¹ - dipyridylum dimethosulphate and 4:4¹ - dipyridylum di - β - hydroxyethyl dichloride.

The residual herbicide of the compositions

PATENT SPECIFICATION

NO DRAWINGS

Inventor: ROBERT COLES BRIAN

913,413



Date of filing Complete Specification: May 29, 1961.

Application Date: June 9, 1960.

No. 20300/60.

Complete Specification Published: Dec. 19, 1962.

Index at acceptance:—Class 81(1), E1C4B(1:3), E1C7B.

International Classification:—A01n.

COMPLETE SPECIFICATION

Herbicidal Compositions containing Corrosion Inhibitors

We, IMPERIAL CHEMICAL INDUSTRIES LIMITED, a British Company, of Imperial Chemical House, Millbank, London, S.W.1, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to herbicidal compositions containing a herbicidal dipyriddylium quaternary salt and a corrosion inhibitor.

The use as herbicides of a variety of dipyriddylium quaternary salts is disclosed in our United Kingdom Specification Nos. 785,732, 813,531, 813,532, 815,348 and 857,501; and these salts have been found to be very effective herbicides when used in the form of aqueous solutions. However, it has been found that in some instances where the aqueous solutions are stored in vessels or used in spray equipment made of zinc or galvanised iron corrosion of the latter occurs, which makes continual use of such vessels or equipment for the aqueous compositions unsuitable.

We have now found that the corrosive action upon zinc and galvanised iron can be lessened very considerably by using in conjunction with the diquaternary salt as corrosion inhibitor a water-soluble molybdate and a phosphate which when dissolved in water gives rise to H_2PO_4^- ions.

Accordingly, the present invention consists in a herbicidal composition comprising a herbicidal dipyriddylium quaternary salt, a phosphate which in aqueous solution gives rise to H_2PO_4^- ions, and a water-soluble molybdate, the phosphate and molybdate being present in such proportions that together they are effective in reducing the corrosive action of the dipyriddylium quaternary salt in aqueous solution.

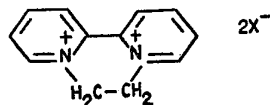
The phosphate used in the composition of this invention can be a water-soluble dihydrogen orthophosphate, for example potassium, sodium, calcium or ammonium dihydro-

gen orthophosphate. However, where it is both possible and desirable to obtain the composition in stable form at a pH of about 3—7, a water-soluble monohydrogen orthophosphate can sometimes be used, for instance di-potassium or di-sodium monohydrogen orthophosphate. Where a monohydrogen orthophosphate is used, it can in suitable conditions be used in admixture with a dihydrogen orthophosphate; for example there can be used a mixture containing potassium dihydrogen and di-potassium hydrogen orthophosphate.

The phosphate (or mixture of phosphates) can be used in an amount from 1% to 20%, or even more, of the weight of the quaternary salt used, but especially from 5—15% by weight. The preferred proportions of phosphate to quaternary salt appear to vary according to the cation of the phosphate; for example it has been found that where calcium phosphate is used the amount required with a given amount of quaternary salt is less than where sodium or potassium phosphate is used. It appears that the amount of phosphate required varies in a direct ratio with its solubility in water.

In general the molybdate is preferably used in an amount of about one tenth of that of the phosphate used. However, larger amounts of molybdate can be used if desired, especially where the phosphate is sodium phosphate. Very satisfactory results have been obtained using sodium molybdate in an amount of from 0.1 to 2% and especially from 0.2 to 1% by weight of the quaternary salt.

The dipyriddylium quaternary salt used in the composition of the invention can be a 1:1¹ - ethylene - 2:2¹ - dipyriddylium salt, for example those of formula:—



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PATENT SPECIFICATION

NO DRAWINGS

1,086,937

Inventor: MICHAEL ROBERT MIDDLETON

Date of filing Complete Specification: Oct. 7, 1964.

Application Date: Oct. 15, 1963.

No. 40643/63.

Complete Specification Published: Oct. 11, 1967.

© Crown Copyright 1967.

Index at acceptance:—A5 E(1C1B, 1C4B1, 1C4B2, 1C4B3, 1C4B4)

Int. Cl.:—A 01 n 19/02

COMPLETE SPECIFICATION

Herbicidal Compositions

ERRATA

SPECIFICATION No. 1,086,937

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Page 2, line 43, for "dipyridylum" read "bipyridylum"

10

Page 3, line 26, for "surface" (first occurrence) read "surfaces"

Page 3, line 40, for "inbibitors" read "inhibitors"

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Page 4, line 3, for "polymersand" read "polymers and"

Page 5, line 55, after "to" (first occurrence) delete "of"

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Page 6, line 19, for "(dimethylmorphodino-carbonylmethyl)" read "(dimethylmorpholinocarbonylmethyl)"

THE PATENT OFFICE

13th November 1967

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of users of the solutions becoming contaminated by splashing when diluting them prior to application. In order to overcome these difficulties it has been discovered that the compounds can be used very satisfactorily in the form of solid compositions which are obtainable by treating an aqueous solution of a bipyridylum herbicide compound with certain salts.

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Accordingly this invention comprises a process of making a solid herbicidal composition which comprises mixing a hydrate-forming salt with an aqueous solution of a bipyridylum herbicide in properties such that the hydrate-forming salt combines with sufficient of the water present to give a solid composition.

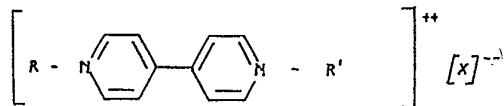
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In a further aspect the invention provides granular herbicidal compositions comprising a bipyridylum herbicide in admixture with a hydrated salt capable of existing in a less hydrated or anhydrous state.

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The composition may contain any bipyridylum salt which possesses herbicidal activity. Suitable compounds include for example one or more salts having the general formula:—



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wherein R and R' are aliphatic groups which may be the same or different and X is the anionic part of the salt. R and R' are preferably unsubstituted alkyl groups having

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IE 027998



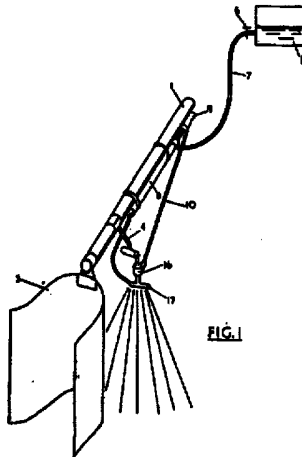
Oifig Na
bPaitinní

The
Patents
Office

27,998. Liquid herbicide sprayer. A 01m.
IMPERIAL CHEMICAL INDUSTRIES
LIMITED, Imperial Chemical House, Millbank,
London S.W. 1, England. June 1, 1964. (603/64).
[Great Britain 22,821, June 5, 1963; May 27, 1964].
[Rule 27(1)(d)].

An agricultural spray applicator comprises a
handle member bearing, a spray guard, a hinged
pivotable spray discharge head adjacent the guard,
and actuating means to pivot the spray discharge
head while causing spray to be discharged.

In Fig. 1 handle member 1 carries a guard 3
at one end; an applicator head 16 fitted with a



spray nozzle 17 is connected by a pivot to an
arm 4 which is attached to member 1. Liquid
herbicide is supplied from a tank 5 by way of a
valve 6 through a pipe 7 to a pump 8 secured to
member 1. The spray is applied by withdrawing
and forcing downward the pump handle 9, which
is attached to the applicator head by an arm 10.

A 01 m

PATENT SPECIFICATION

DRAWINGS ATTACHED

Inventor: ROBERT WATTS

1.152.847

1.152.847



Date of filing Complete Specification: 15 July, 1966.

Application Date: 4 Aug., 1965.

No. 33354/65.

Complete Specification Published: 21 May, 1969.

© Crown Copyright 1969.

Index at acceptance: —A1 D(3A8, 3B3)

Int. Cl.: —A 01 m 7/00

COMPLETE SPECIFICATION

Improvements in or relating to Liquid Applicators

We, IMPERIAL CHEMICAL INDUSTRIES LIMITED, a British Company of Imperial Chemical House, Millbank, London, S.W.1., do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to an improved applicator for applying liquid, particularly liquid herbicide, to weeds infesting ground between rows of growing plants, whilst at the same time preventing the liquid from falling onto the plants.

In the horticultural industry, plants such as, vegetable and ornamental plants are grown in rows. During their growth the ground between the rows tends to become infested with weeds which have to be combated if the healthy development of the plants is not to be impaired. Various methods are used for the purpose, for example mechanical methods such as hoeing are frequently employed and the use of herbicides is becoming more widespread. When a herbicide is used precautions have to be taken to prevent the herbicide falling onto the plants. One method which has been proposed is to use an applicator having side guards and a distributor head which discharges the herbicide onto the ground between the guards. By means of such a device the combating of weeds growing between the rows of plants has been facilitated, however the employment of such a device is subject to a number of important disadvantages. Conventional herbicides are liable to penetrate the ground and if applied too near to the plants will damage them by absorption through their roots even though none of the herbicidal liquid actually falls onto the plants. Another disadvantage is that the degree of separation of the side guards in conventional applicators is not capable of ready alteration, consequently as the applicator is

moved along between the rows of plants there will be areas of ground which have not been treated with herbicide where the rows diverge slightly, due to irregular sowing of seed or planting out of seedlings. On the other hand where the rows converge there is a danger that the conventional herbicide will be applied too near to the plants and thereby damage them for the reason explained above. As a result of these disadvantages whilst conventional applicators have been successful in combating weeds growing between the rows of plants, but separated by a fairly substantial distance from the plant, they have not been suitable for the destruction of weeds growing in close proximity to them.

In recent years a new class of herbicides has been developed which comprises bipyridyl compounds. Herbicides incorporating these compounds are sold under the Trade Marks 'GRAMOXONE', 'PREEGLONE' and 'REGLONE'. These herbicides have the unique property of destroying, or severely damaging weeds with great rapidity but which are rapidly deactivated by contact with soil. This deactivation is so rapid that a weed growing in close proximity to a plant can be destroyed and yet the herbicide is unable to penetrate sufficiently deeply into the soil to harm the plants by absorption through their roots. This unique property of the herbicides enables them to be applied much more closely to plants than is possible in the case of a conventional herbicide. Consequently, provided sufficient care is taken to prevent these new herbicides falling onto the plants, they can be used to combat weeds growing in much closer proximity to plants than has been possible hitherto. These new herbicides nevertheless create problems in the design of a satisfactory applicator which is capable of applying the herbicide with precision necessary to combat weeds growing in close proximity of the plants and at the

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3,527,593

HERBICIDE-AMINE OXIDE COMPOSITIONS AND THEIR USE

Robert Coles Brian and Peter Douglas Bland, Bracknell, England, assignors to Imperial Chemical Industries Limited, London, England, a corporation of Great Britain

No Drawing. Filed Nov. 30, 1966, Ser. No. 597,849
Claims priority, application Great Britain, Dec. 20, 1965, 53,824/65

Int. Cl. A01n 9/20, 11/02

U.S. Cl. 71—94

16 Claims

ABSTRACT OF THE DISCLOSURE

Herbicidal compositions containing herbicide and an amine oxide wetting agent. Preferred herbicides are the bipyridylum herbicides while typical amine oxides include, for example, octyl dimethylamine N-oxide and the corresponding decyl-, dodecyl-, tetradecyl-, pentadecyl- and hexadecyl-dimethylamine N-oxides.

The present invention relates to improved herbicidal compositions and to their use.

It has been found that although herbicides are frequently employed in the form of compositions containing a wetting agent, the use of an amine oxide surface active agent renders the composition more effective and appears to assist in the dissemination of the herbicide throughout the plant system.

Accordingly, the present invention comprises a composition containing a herbicide and an amine oxide wetting agent. It further comprises a process of treating plants with such compositions.

Examples of suitable herbicides include herbicidal amides, carbamates, ureas, triazines, phenoxycarboxylic acids and inorganic compounds. Examples of specific compounds are:

AMIDES

N,N-diallylchloroacetamide
3,4-dichloropropionanilide
N-(3-chloro-4-methyl-phenyl)-2-methylpentamide
N-(3,4-dichlorophenyl)-methacrylamide
N,N-dimethyldiphenylacetamide

CARBAMATES

Isopropyl-N-phenylcarbamate
Isopropyl-N-(3-chlorophenyl) carbamate
4-chloro-2-but-ynyl-N-(3-chlorophenyl) carbamate
2-chlorallyl-N,N-diethyl-dithiocarbamate
S-ethyl-N,N-dipropylthiol carbamate
S-propyl-N-butyl-N-ethylthiolcarbamate
S-2,3-dichlorallyl-N,N-di-isopropyl thiolcarbamate
S-2,3,3-trichlorallyl-N,N-di-isopropyl thiolcarbamate
Sodium N-methyldithiocarbamate

UREAS AND ANILIDES

N,N'-di-(2,2,2-trichloro-1-hydroxyethyl) urea
O-chloroisobutyranilide
 α -Bromo-3,4-dichloroacetanilide
N,N-dimethyl-N'-phenylthiourea
N-phenyl-N',N-dimethyl urea
N-(4-chlorophenyl)-N',N'-dimethyl urea
N'-(4-chlorophenyl)-N-methoxy-N-methylurea
N-thiourea(3,4-dichlorophenyl)-N',N'-dimethyl urea
N-butyl-N'-(3,4-dichlorophenyl)-N-methyl urea
N'-(3,4-dichlorophenyl)-N-methoxy-N-methyl urea
N'-4-(4-chlorophenoxy)-phenyl-N,N-dimethyl urea

DIAZINES

3,4,5,6-tetrahydro-3,5-dimethyl-2-thio-2H-1,3,5-thiadiazine

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5-bromo-3-s-butyl-6-methyluracil
5-amino-4-chloro-2-phenyl-3-pyridazine
1,2,3,6-tetrahydro-3,6-dioxypyridazine
2-chloro-4,6-bisethylamino-1,3,5-triazine
2-chloro-4-ethylamino-6-isopropylamino-1,3,5-triazine
2-chloro-4,6-bisopropylamino-1,3,5-triazine
4-ethylamino-6-isopropylamino-2-methoxy-1,3,5-triazine
4,6-bisopropylamino-2-methoxy-1,3,5-triazine
2-methylmercapto-4,6-bisethylamino-s-triazine
2-methylmercapto-4,6-bisopropylamino-s-triazine
2-methylmercapto-4-ethylamino-6-isopropylamino-s-triazine
2-chloro-4-diethylamino-6-ethylamino-1,3,5-triazine
4,6-bisethylamino-2-methoxy-1,3,5-triazine
4-isopropylamino-6-methylamino-2-methylmercapto-1,3,5-triazine

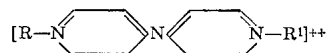
PHENOXYCARBOXYLIC ACID HERBICIDES

4-chloro-2-methyl phenoxyacetic acid
2,4 dichlorophenoxyacetic acid
2,4,5 trichlorophenoxyacetic acid
2-(4, chloro-2-ethylphenoxy) propionic acid
 α -(2,4, dichlorophenoxy) propionic acid
 γ -2,4,5 trichlorophenoxy) butyric acid

INORGANIC HERBICIDES

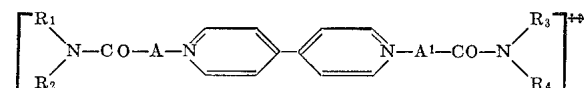
Sodium chlorate
Sodium arsenite
Ammonium sulphamate
Potassium cyanate

Preferred compositions in accordance with the invention are those including a bipyridylum compound as the herbicide. Such compounds are preferably in the form of bipyridylum salts and suitable compounds include those having a cation of the formula:



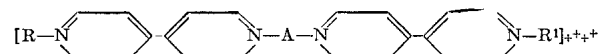
wherein R and R¹ are aliphatic groups which may be the same or different, associated with one or more suitable anionic radicals or groups. R and R¹ are preferably alkyl groups having from 1 to 20 carbon atoms. Either R or R¹ may be unsaturated or be substituted.

Other compounds which may be used have a cationic group of the general formula:



wherein R₁, R₂, R₃ and R₄ are hydrogen, alkyl, alkoxy-alkyl, A and A¹ comprise a divalent aliphatic group, for example one or more methylene groups, associated with one or more suitable anionic radicals or groups not represented in the formula.

Compounds also having herbicidal activity have the quadrivalent cationic group of the general formula:



wherein R and R¹ are substituted or unsubstituted alkyl groups having from 1 to 20 carbon atoms and A is a divalent aliphatic bridging group which preferably comprises from 1 to 6 methylene groups. Suitable anionic groups for all the above bipyridylum compounds are represented by the halides, though many other anions may also be used, e.g. phosphate, sulphate, acetate, nitrate.

Specific examples of suitable compounds are:

1,1'-dimethyl-4,4'-bipyridylum dichloride
1,1'-dimethyl-4,4'-bipyridylum dimethosulphate
1,1'-bis- β -chloroethyl-4,4'-bipyridylum dibromide

PATENT SPECIFICATION

(11) 1 209 996

NO DRAWINGS

1 209 996

- (21) Application No. 23336/68 (22) Filed 16 May 1968
 (23) Complete Specification filed 14 April 1969
 (45) Complete Specification published 28 Oct. 1970
 (51) International Classification A 01 n 9/36
 (52) Index at acceptance
 A5E 1C15 1C1A 1C3B1 1C3B3 1C4A3 1C4A4
 (72) Inventor GORDON JAMES MARRS



(54) WETTABLE POWDERS

(71) We, IMPERIAL CHEMICAL INDUSTRIES LIMITED, a British Company, of Imperial Chemical House, Millbank, London S.W.1., do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:

This invention relates to wettable powders.

Water-insoluble pesticides are frequently formulated as wettable powders; that is, as powders which when mixed with water, with or without added wetting agent, disperse to give a suspension which can conveniently be applied by spraying. Many pesticides, notably insecticides and in particular organophosphorus compounds, are water-insoluble liquids. Such liquids can be formulated as wettable powders by absorption on fillers; however, there is a tendency for such powders when added to water to "strip"; that is, for the active ingredient to be washed off the absorbing filler and to emulsify with water. This can have various undesirable results; for example, emulsions containing the active ingredient tend to evaporate more rapidly from e.g. the leaves of plants with consequent loss in pesticidal efficiency; and when emulsions are sprayed onto porous surfaces the active ingredient migrates into the surface where it is generally less effective as a pesticide.

The object of the present invention is to provide wettable powder compositions of water-insoluble liquid pesticides having a reduced tendency to "strip"; that is, for the water-insoluble liquid pesticides to emulsify.

According to the present invention we provide a wettable powder composition comprising a water-insoluble liquid pesticide, a highly absorbent filler (as hereinafter defined), a water-soluble polymer, a wetting agent and a dispersing agent. Preferably

the composition also comprises a second filler.

Any water-insoluble liquid pesticide may be formulated according to the present invention, including herbicides, fungicides and insecticides. In this specification and claims the term "water-insoluble" will be understood to refer to immiscibility with water of the pesticide at the concentration at which it is applied in the form of an aqueous spray; which concentration may be as low as 0.001% weight. This invention is likely to find its widest use with insecticides, and in particular with organophosphorus insecticides, many of which are water-insoluble liquids.

Examples of specific insecticides include parathion and methylparathion; preferred insecticides on account of their lower mammalian toxicity are malathion and fenitrothion. The active ingredient used preferably constitutes from 15 to 40% by weight of the composition and particularly from 20 to 35% by weight of the composition.

By a highly absorbent filler we mean a filler with an oil absorption value of at least 100 grams oil per 100 grams filler (BS test 3483). Preferably the highly absorbent filler used has an oil absorption value of at least 170. Suitable fillers include high surface area silica fillers for example those sold under the Trade Marks "Manosil", "Hysil" and "Gasil"; these may have oil absorption values as high as 300. The quantity of highly absorbent filler used in the formulation should be at least sufficient to absorb the active ingredient, and it is generally preferable to use an excess to ensure complete absorption. Preferably therefore the proportion by weight of highly absorbent filler in the composition is the same as or greater than the proportion of active ingredient.

The water-soluble polymer is generally used in an amount of from 1-20% by weight of the composition, and preferably from 5-

PATENT SPECIFICATION

(11) 1 298 340

1 298 340

DRAWINGS ATTACHED

- (21) Application No. 11141/69 (22) Filed 3 March 1969
 (23) Complete Specification filed 18 Feb. 1970
 (45) Complete Specification published 29 Nov. 1972
 (51) International Classification F04B 9/14
 (52) Index at acceptance
 F1A 1A3 1B8B 1C1 4Q
 (72) Inventor JAMES EDWARD ELSWORTH



(54) IMPROVEMENTS IN SPRAYERS

(71) We IMPERIAL CHEMICAL INDUSTRIES LIMITED, a British Company of Imperial Chemical House, Millbank, London, S.W.1., do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to portable sprayers, and more particularly to sprayers intended to be carried on the back of the man and having a pump actuated by a lever oscillated by the bearer.

Sprayers of the latter kind are often used for small scale application of agricultural chemicals. However, different agricultural chemicals require to be applied as sprays having different characteristics, with the result that in general a sprayer which is convenient for use with herbicides, for example, is less convenient for use with insecticides, and vice versa. This is because it is preferred to apply herbicides as a spray wherein the droplets are relatively large, so that the possibility of drift on to neighbouring crops is reduced. This in turn means that the spray liquid is required to be applied at a low pressure, and that a large volume of liquid is needed. With insecticides on the other hand, it is preferred that the spray should be a mist of fine droplets capable of penetrating into foliage. The spray liquid is therefore required to be forced through fine spray apertures at a high pressure, and only a small volume of liquid is required. The force which the operator is required to apply in order to oscillate the lever actuating the pump may be inconveniently increased when a sprayer designed to produce a coarse spray at a low pressure is used to produce a fine spray.

A sprayer has now been devised in which the mechanical advantage provided by the lever in actuating the sprayer pump can be varied by the operator when applying sprays at various pressures.

According to the present invention there is provided a portable sprayer comprising a reservoir for spray liquid, a pump in com-

munication with the reservoir, and an actuating lever for the pump connected thereto by a connecting member having a point of pivotal attachment to the lever, the fulcrum of the lever being fixed relative to the reservoir and located at one of a plurality of alternative pivot points on the lever between the end thereof and the point of attachment of the connecting member, whereby the distance between the point of attachment of the connecting member and the fulcrum of the lever may be selectively varied.

The following description, with reference to the drawings accompanying the provisional Specification shows one example of how the invention may be carried into effect.

In the drawings:— Figure 1 is a diagrammatic representation of a side view of a sprayer according to the invention.

Figure 2 is a diagrammatic representation of another side view of the sprayer of Figure 1.

Referring now to the drawings, the sprayer comprises a reservoir 1 and a pump 2 (details of construction not shown). A lever 3 is pivotally mounted on a pin 4 carried by a bracket 5 attached to the reservoir 1. The lever is adapted for an alternative pivotal mounting on the bracket 5 by means of a hole 6. A connecting rod 7 links the lever 3 to the pump 2. When it is desired to alter the mechanical advantage of the lever 3, the lever is detached from the pin 4 and remounted using the hole 6. The new position of the connecting rod and lever are indicated by the broken lines in Fig. 2.

With the connecting rod in the position shown by the broken lines the sprayer is better adapted for spraying herbicides, the mechanical advantage of the lever being represented by

the ratio $\frac{a_2}{b_2}$. With the connecting rod in the

position shown by unbroken lines, the sprayer is better adapted for the spraying of insecticides, and the mechanical advantage of the

[Price 25p]

PATENT SPECIFICATION No. (11)

36536

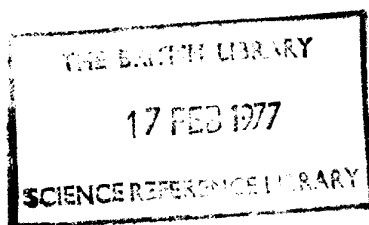
36536



*Date of Application and Filing Complete
Specification: (22) 6 July 1972
(21) No. 953/72*

*Application made in: (33) Great Britain
(31) No. 34451/71 (32) 22 July 1971
(31) No. 3010/72 (32) 21 Jan. 1972*

*Complete Specification Published:
(45) 24 Nov. 1976*



(51) **Int. Cl.** AQIN 9/22, 17/10

© **Government of Ireland** 1976

COMPLETE SPECIFICATION

(54)

IMPROVED HERBICIDAL COMPOSITIONS

PATENT APPLICATION BY (71) IMPERIAL CHEMICAL INDUSTRIES LIMITED, A BRITISH COMPANY, OF IMPERIAL CHEMICAL HOUSE, MILLBANK, LONDON, S.W.1., ENGLAND.

Price 12½p

SUBSTITUTE
REMPLACEMENT

SECTION is not Present
Cette Section est Absente